Claims 2, 3, 4, 5, 6, 8, 13, 15, 16, 17, 20, 21, 22, 23, 24, 30, 31, 32, 33, 34, 35, 41, 43, 44, 48, 49 and 50 have been canceled.

Claims 1, 7, 9, 10, 11, 12, 14, 18, 25, 26, 27, 28, 29, 36, 37, 38, 39, 40, 42, 45, 46 and 47 have been amended.

New claims 51 to 68 have been added.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (amended) A packet-switched multiple-access network system [comprising] having a shared communication channel connecting a plurality of stations, [a first station connected to the shared communication channel, and a second station connected to the shared communication channel, wherein the first station and the second station] each station comprising [comprise]:

a network interface, the network interface transmitting packets to the shared communication channel and receiving packets from the shared communication channel; [and

a distributed fair priority queuing MAC (Media Access Control) protocol executed by the first station and by the second station, the distributed fair priority queuing MAC protocol resolving packet collisions between the first station and the second station on a per packet per access priority basis];

a carrier sense for sensing whether the shared communication channel is in use and for preventing transmissions by the station when the shared communication channel is in use;

a collision detect for detecting the occurrence of a collision between a first transmission by the station and a second transmission on the shared communication channel, and for causing a collision notification signal to be transmitted to the shared communication channel by the station when a collision is detected;

a slot timer for dividing a time period following successful completion of a transmission on the shared communication channel into a plurality of contention slots in order of priority;

a controller for monitoring a priority of a data packet awaiting transmission and for delaying transmission of the data packet awaiting transmission until a contention slot corresponding to the priority of the data packet;

wherein, when the station detects a collision of the data packet in a contention slot, the station enters a contention protocol

to resolve the collision between contending stations for that contention slot; and

wherein, when the station receives a collision notification signal from the shared communication channel and the station was not involved in the collision, the station reduces the priority of the data packet awaiting transmission so as to withhold transmission until completion of the contention protocol between contending stations.

7. (amended) The system as in Claim 1, [6] wherein the contention protocol includes dividing a time interval[s] [between] following a [packet transmissions] collision [over the channel are divided] into a plurality of signal [contention] slots[, and the contention slots are used for packet transmission contention opportunities that are ordered according to access priority].

9. (amended) The system as in Claim 7, [8] wherein the signal slots are used for signaling opportunities for contending stations [the first station and the second station] to share information [used] for the contention protocol [collision resolution] implemented using a tree or stack-based collision resolution technique.

10. (amended) The system as in Claim 7, [8] wherein each contending station which has entered the contention protocol [contending for access in a given collision resolution cycle] pseudo-randomly selects one of [among] the plurality of [possible] signal slots, and signals that selection [vote] by transmitting a signal onto the shared communication channel in the selected signal slot.

11. (amended) The system as in Claim 7, [8] wherein the controller for monitoring the priority of the data packet awaiting transmission [network interface] further comprises:

a first stack [counter per priority] that indicates a priority level of contending stations [the stack level above current active stations with which the first station is waiting to resolve its collision, and];

a second stack that indicates the priority of the data packet awaiting transmission; and

control logic [executed by the first station and the second station] for incrementing and decrementing the second stack [first counter] based on at least one of [one or more of the following]: (a) a carrier sense signal; (b) a collision detect signal; (c) a collision notification signal; and [or] (d [c]) a transmitted signal in a signal slot [voting signals].

12. (amended) The system as in Claim 11, wherein the [network interface further comprises a second counter that indicates the maximum stack level per priority of the first station and the second station, wherein the second counter] first stack is used to initialize the second stack [first counter] when the [first] station has prepared a new packet for transmission.

14. (amended) The system as in Claim 9, [8] wherein a [the] pattern of selection of signal slots by a station [votes used] in the contention protocol [a collision resolution cycle] conveys side-band signaling information to other stations [from the first station to the second station], whereby the selection of signal slots [pattern of votes] is used to specify a subordinate level of priority within the priority level associated with the contention protocol [collision resolution cycle].

18. (amended) The system as in Claim 1, [6] wherein the collision notification signal has [collisions are signaled from the transmitting stations to all other stations by] a duration of

transmission interval that is distinguishable from the range of transmission intervals used by non-colliding transmissions.

25. (amended) A channel signal [Computer data signals in a carrier wave signal] transmitted over a packet-switched multiple-access network, the channel signal comprising:

a collision notification signal for indicating a collision of transmissions by contending stations in a contention slot, and for causing non-contending stations connected to the network to delay transmission for a period sufficient to allow resolution of the collision between the contending stations;

at least one collision resolution signal after the collision notification signal, the collision resolution signal occurring a predetermined period after the collision notification signal so as to fall within one of a plurality of signal slots;

a data packet transmission signal after the at least one collision resolution signal, the data packet transmission signal occurring a predetermined period after the collision resolution signal so as to fall within one of a plurality of contention slots, each contention slot having a unique priority to provide multiple levels of priority of access.

[a collision signal, the collision signal indicating a collision of a packet sent by a first station connected to the network with a packet sent by a second station connected to the network; and

at least two contention slots, the contention slots, which each have a different priority to provide multiple levels of priority of access, being used for contention transmission opportunities controlled by a distributed fair priority queuing MAC (Media Access Control) protocol executed by the first station and by the second station to resolve the packet collision on a per packet per access priority basis.]

26. (amended) The [carrier wave] channel signal as in Claim 25, wherein the collision resolution signal is used to share information between stations used for collision resolution.
[further comprising:

multiple signal slots, the signal slots being used for signaling opportunities by the first station and by the second station to share information used for collision resolution by the distributed fair priority queuing MAC protocol executed by the first station and by the second station.]

27. (amended) The [carrier wave] channel signal as in Claim 25, further comprising:

side-band signaling at the MAC layer, the side-band signaling providing information for the PHY (physical) layer; and

a deterministic label indicator slot for indicating that the pattern of votes by a station in the signal slots is the result of a station intending to convey side-band signaling information for the PHY layer.

28. (amended) The [carrier wave] channel signal as in Claim 25, further comprising:

a HOLDOFF [signal] period between the plurality of signal slots and the plurality of contention slots, the HOLDOFF [signal] period being used to suspend the collision resolution between contending stations for a predetermined time interval such that the predetermined time interval can be used for access by a third station that is not executing the collision resolution protocol.

29. (amended) A method for a packet-switched multiple-access network, the method comprising:

transmitting packets to a shared communication channel and receiving packets from the channel; [and

executing a distributed fair priority queuing MAC (Media Access Control) protocol, the distributed fair priority queuing MAC protocol resolving packet collisions on the channel on a per packet per access priority basis such that stations connected to the channel will have a fair and prioritized opportunity to transmit pending packets]

sensing whether the channel is in use and preventing transmissions when the channel is in use;

detecting the occurrence of a collision on the channel between a first transmission and a second transmission;

transmitting a collision notification signal to the channel when a collision is detected;

dividing a time period following successful completion of a transmission on the channel into a plurality of contention slots in order of priority;

delaying transmission of a first data packet awaiting transmission until a contention slot corresponding to the priority of the first data packet awaiting transmission;

upon detection of a collision in a contention slot, entering a contention protocol to resolve the collision between contending stations for that contention slot; and

where a second data packet awaiting transmission was not involved in a collision detected in a contention slot, reducing a priority of the second data packet awaiting transmission so as to withhold transmission of the second data packet until completion of the contention protocol between contending stations.

36. (amended) The method as in Claim 29, [35] wherein the signal slots are used for signaling opportunities for the first station to share information with other stations which are connected to the channel, used for the contention protocol [collision resolution by the distributed fair priority queuing MAC protocol].

37. (amended) The method as in Claim 36, [35] wherein the contention [signal slots are used for signaling opportunities for a first station to share information with other stations, which are connected to the channel, and the signal slots are used for collision resolution] protocol is implemented using a tree or stack-based collision resolution technique.

38. (amended) The method as in Claim 36, [35] wherein the contention protocol comprises each station contending for access in a given contention slot [resolution cycle] pseudo-randomly selecting [selects] among the possible signal slots and signaling [signals] that vote by transmitting a signal during the selected signal slot.

39. (amended) The method as in Claim 29, [35] further comprising:

providing a first stack [counter per priority] that indicates a priority level of contending stations [the stack level above the current active stations with which the station is waiting to resolve its collision, and];

providing a second stack that indicates the priority of the data packet awaiting transmission; and

incrementing and decrementing the second stack [first counter] based on at least one [one or more] of the following: (a) a carrier sense signal; (b) a collision detect signal; (c) a collision notification signal; and [or] (d[c]) a transmitted signal in a signal slot [voting signals].

40. (amended) The method as in Claim 39, [further comprising:

providing a second counter that indicates the maximum stack level per priority for any station connected to the channel], wherein the first stack [second counter] is used to initialize the second

stack [first counter] when [the first station has prepared] a new packet has been prepared for transmission.

42. (amended) The method in Claim 29, [35] wherein a pattern of selection of signal slots by a station [votes used] in the contention protocol [a collision resolution cycle is used to] conveys side-band signaling information to other stations, whereby the selection of signal slots is used to specify a subordinate level of priority within the priority level associated with the contention protocol [collision resolution cycle].

45. (amended) The method as in Claim 29, [35] wherein the collision notification signal has [collisions are signaled from transmitting stations to other stations connected to the channel by] a [predetermined] duration of transmission interval that is distinguishable from a [the duration of] transmission interval[s] used by a non-colliding transmission[s].

46. (amended) The method as in Claim 45, further comprising simulating [wherein the first station simulates] a collision by forcing a [its] transmission to have a duration that falls within the predetermined duration defined for collisions.

47. (amended) The method as in Claim 34, further comprising:

transmitting a HOLDOFF signal, the HOLDOFF signal being used to suspend the contention protocol [distributed fair priority queuing MAC protocol] for a predetermined time interval such that the predetermiend time interval can be used for access by a station that is not executing the contention protocol [distributed fair priority queuing MAC protocol].